

WE CLAIM:

1. A method of dynamic measurement of a communication channel using Direct Sequence Spread Spectrum (DSSS) communication system, comprising the steps of:

- (a) generating a Pseudo Noise (PN) code where $(\gamma_0=1/T)$;
- (b) modulating a carrier $(\cos. 2\pi\gamma_c)$ with the PN code;
- (c) providing the PN coded data signal $[s(t)]$ to a correlator via a communication channel that includes a channel noise signal for determining transmission characteristics of the channel; and
- (d) determining a correlator value for extracting the PN code from the coded data signal, where the correlator value is the wanted exact measure of the loss of the channel under test.

2. The method of Claim 1 further comprising the steps of:

- (e) selecting a Signal to Noise Ratio as a threshold for reliable communication in the channel;
- (f) comparing the correlation value to this threshold; and
- (g) determining if the correlation value is above or below the threshold, where a correlation value below the threshold is indicative of unreliable transmission through the channel.

1 3. The method of Claim 1 and 2 further comprising the steps of:
2 (h) adjusting the frequency of the carrier to frequencies relevant for the transmission
3 of the data information content; and
4 (i) and measuring the correlation value for each carrier frequency, where the
5 correlation value vs. frequency is a measure for the frequency dependent loss of the channel.

1 4. The method of Claim 1 further comprising the steps of:
2 (j) adjusting the power level of the data to compensate for attenuation of the
3 transmitted data.

1 5. The method of Claim 1 further comprising the step of:
2 (k) altering the correlation value by adjusting the PN code rate (γ_0) or the carrier
3 frequency (γ_c).

1 6. The method of Claim 1 further comprising the step of:
2 (l) adjusting the length of the PN code sequence to compensate for a noisy
3 environment.

1 7. The method of Claim 1 further comprising the step of modulating the PN sequence and/or
2 the carrier and/or the PN modulated carrier with a data signal $[m(t)]$.

1 8. The method of Claim 1 further comprising the step of:

2 (m) determining the presence of an unreliable data transmission where the
3 predetermined maximum PN code length does not exceed the threshold value.

1 9. A system of dynamic measurement of a communication channel using Direct Sequence
2 Spread Spectrum (DSSS) communication system, comprising:

3 (a) code generating apparatus which generates a Pseudo Noise (PN) code where $(\gamma_0$
4 $=1/T)$;

5 (b) carrier modulating apparatus which modulates a carrier $(\cos. 2\pi\gamma_c)$ with the PN
6 code;

7 (c) data modulating apparatus which modulates the PN coded carrier with a data
8 signal $[m(t)]$;

9 (d) transmitter apparatus which transmits the PN coded data signal $[s(t)]$ to a
10 correlator via a communication channel for determining transmission characteristics of the
11 channel;

12 (e) frequency-controlling apparatus that tunes the carrier frequency to predetermined
13 frequencies relevant for the transmission of the data content;

14 (f) decoding apparatus which determines a correlator value for each frequency for
15 extracting the PN code from the coded data signal; and

16 (g) analysis apparatus which keeps track of the correlator values and thereby
17 determines the frequency dependent loss of the transmission channel.

1 10. A system of dynamic measurement of a communication channel using Direct Sequence
2 Spread Spectrum (DSSS) communication system, comprising:

3 (a) code generating apparatus which generates a Pseudo Noise (PN) code where $(\gamma_0$
4 $=1/T)$;

5 (b) carrier modulating apparatus which modulates a carrier $(\cos. 2\Sigma\gamma_c)$ with the PN
6 code;

7 (c) data modulating apparatus which modulates the PN coded carrier with a data
8 signal $[m(t)]$;

9 (d) transmitter apparatus which transmits the PN coded data signal $[s(t)]$ to a
10 correlator via a communication channel for determining transmission characteristics of the
11 channel;

12 (e) selecting apparatus which select a Signal to Noise Ratio as a threshold for reliable
13 communication in the channel;

14 (f) decoding apparatus which determines a correlator value for extracting the PN
15 code from the coded data signal;

16 (g) comparison apparatus which compares the correlation value of the PN code to the
17 threshold value; and

18 (h) analysis apparatus which determines if the correlation variable is above or below
19 the threshold; where a correlation value below the threshold is indicative of unreliable
20 transmission through the channel and a correlator value above the threshold is indicative of
21 reliable transmission through the channel.

11. A method of dynamic measurement of a communication channel using Direct Sequence
Spread Spectrum (DSSS) communication system, comprising the steps of:

- 2 (a) generating a Pseudo Noise (PN) code where $(\gamma_0 = 1/T)$;
- 3 (b) modulating a carrier $(\cos. 2\pi\gamma_c)$ with the PN code;
- 4 (c) modulating the PN coded carrier with a data signal $[m(t)]$;
- 5 (d) providing the PN coded data signal $[s(t)]$ plus a channel noise signal to a
6 correlator via a communication channel for determining transmission characteristics of the
7 channel;
- 8 (e) selecting a Signal to Noise Ratio as a threshold for reliable communication in the
9 channel;
- 10 (f) determining a correlator value for extracting the PN code from the coded data
11 signal;
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13 (g) comparing the correlation value of the PN code to the threshold value; and
14 (h) determining if the correlation variable is above or below the threshold;
15 where a correlation value below the threshold is indicative of unreliable transmission
16 through the channel and a correlator value above the threshold is indicative of reliable
17 transmission through the channel.

1 12. The method of Claim 11 further comprising the steps of:
2 (i) adjusting the power level of the data to compensate for attenuation of the
3 transmitted data.
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11 13. The method of Claim 11 further comprising the step of:
12 (j) altering the correlation value by adjusting the PN code rate (γ_0) or the carrier
13 frequency (γ_c).

1 14. The method of Claim 11 further comprising the step of:
2 (k) adjusting the length of the PN code sequence to compensate for a noisy
3 environment.

1 15. The method of Claim 11 further comprising the step of:

2 (l) determining the presence of an unreliable data transmission where the
3 predetermined maximum PN code length does not exceed the threshold value.

1 16. A system of dynamic measurement of a communication channel using Direct Sequence
2 Spread Spectrum (DSSS) communication system, comprising:

3 (a) code generating apparatus which generates a Pseudo Noise (PN) code where (γ_0
4 $=1/T$);

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(b) carrier modulating apparatus which modulates a carrier ($\cos. 2\pi\gamma_c$) with the PN
code;

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(c) data modulating apparatus which modulates the PN coded carrier with a data
signal $[m(t)]$;

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(d) transmitter apparatus which transmits the PN coded data signal $[s(t)]$ to a

correlator via a communication channel for determining transmission characteristics of the
channel;

12 (e) selecting apparatus which select a Signal to Noise Ratio as a threshold for reliable
13 communication in the channel;

14 (f) decoding apparatus which determines a correlator value for extracting the PN
15 code from the coded data signal;

1 18. ¹⁷ The medium of Claim 17 further comprising
2 (e) program instructions selecting a Signal to Noise Ratio as a threshold for reliable
3 communication in the channel;
4 (f) program instructions comparing the correlation value to this threshold; and
5 (g) program instructions determining if the correlation value is above or below the
6 threshold, where a correlation value below the threshold is indicative of unreliable transmission
7 through the channel.

8 19. ¹⁸ The medium of Claim 17 and 18 further comprising:
9 (h) program instructions adjusting the frequency of the carrier to frequencies relevant
10 for the transmission of the data information content; and
11 (i) program instructions measuring the correlation value for each carrier frequency,
12 where the correlation value vs. frequency is a measure for the frequency dependent loss of the
13 channel.
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15 20. ¹⁹ The medium of Claim 17 further comprising:
16 (j) program instructions adjusting the power level of the data to compensate for
17 attenuation of the transmitted data.

1 26 The medium of Claim 17 further comprising:
2 (k) program instructions altering the correlation value by adjusting the PN code rate
3 (γ_0) or the carrier frequency (γ_c).

1 22. The medium of Claim 17 further comprising:
2 (l) program instructions adjusting the length of the PN code sequence to compensate
3 for a noisy environment.

1 23. The medium of Claim 17 further comprising:
2 (m) program instructions modulating the PN sequence and/or the carrier and/or the PN
3 modulated carrier with a data signal $[m(t)]$.

1 24. The medium of Claim 17 further comprising:
2 (n) program instructions determining the presence of an unreliable data transmission
3 where the predetermined maximum PN code length does not exceed the threshold value.